

31333
S/569/61/001/000/018/019
D274/D304

16,4000(1103,1329,1132)

AUTHORS: Ayzerman, M. A., and Gantmakher, F. R. (USSR)

TITLE: Some problems in the theory of nonlinear control systems with discontinuous characteristics

SOURCE: International Federation of Automatic Control. 1st Congress, Moscow, 1960. Teoriya nepreryvnykh sistem. Spetsial'nyye matematicheskiye problemy. Moscow, Izd-vo AN SSSR, 1961. Trudy, v. 1, 679-690

TEXT: A system with one nonlinear element is described by

$$\dot{x}_i = \sum_{j=1}^n a_{ij}x_j + \lambda_i y, \quad (i = 1, 2, \dots, n), \quad (1)$$

where $y = f(x_1)$ is a piecewise linear function. If the phase space of the system is divided by the discontinuity surfaces

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$$F_{\alpha}(x_1, x_2, \dots, x_n) = 0; \quad (\alpha = 1, 2, \dots, n) \quad (2)$$

into parts, then the process in each part is described by

$$\dot{x}_i = f_i(x_1, x_2, \dots, x_n); \quad (i = 1, 2, \dots, n) \quad (3)$$

where the right-hand sides are continuous. Certain aspects of the processes are discussed which arise on passing from one system (3) to another, through (2). An exact method is proposed for determining the periodic solutions in systems of type (1). Stability of the periodic solutions is analyzed. The systems of Eqs. (1) or (3) do not completely determine the motion, as the passage of the representative point in phase space through the discontinuity surface is not taken into account, nor is the motion of that point along the surface. For that purpose, the discontinuity surface is divided, by means of the manifolds Γ^+ and Γ^- , into slip regions C and regular regions P. The motion of the representative point is determined by means of these regions. Further, the response equation is defined as that obtained from system (1) by eliminating all

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x_1 , except $x_1 = x$. If $f(x_1)$ is continuous and sufficiently smooth, the response equation for system (1) is written

$$D(p)x = K(p)y, \quad (4)$$

where

$$y = f(x), \quad p = \frac{d}{dt}, \quad x = x_1.$$

But in the present case, Eq. (4) has to be supplemented by the conditions (jumps) at the discontinuity surfaces:

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$$\left. \begin{aligned} & a_0 \xi_0 = b_0 \eta_0 , \\ & a_0 \xi_1 + a_1 \xi_0 = b_0 \eta_1 + b_1 \eta_0 , \\ & \dots\dots\dots \\ & a_0 \xi_{n-1} + a_1 \xi_{n-2} + \dots + a_{n-1} \xi_0 = b_0 \eta_{n-1} + b_1 \eta_{n-2} + \dots + b_{n-1} \eta_0 , \end{aligned} \right\} (5)$$

where ξ and η are the discontinuities of x and y respectively

$$D(p) = a_0 p^n + \dots + a_n,$$

$$K(p) = b_0 p^n + \dots + b_n \quad .$$

Further, the concept of "response equation" is discussed. The conditions of transition from one branch of the characteristic to another in systems

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of type (1) involve 5 possible cases. Two of these cases correspond to special switching conditions and were apparently discovered by the authors; they are called "pseudoregular" and "pseudoslip" respectively. In all systems of type (1), as well as in systems which differ from (1) by the presence of a given periodic disturbance, the periodic solutions can be found exactly, i.e., without neglecting the harmonics. For this purpose, the authors used a method proposed by Ye. N. Rozenvasser, whereby system (1) is replaced (4) and (5); in (4), x and y are replaced by

$$x = \sum_{r=-\infty}^{+\infty} \alpha_r e^{ir\omega t}, \quad y = \sum_{r=-\infty}^{+\infty} \beta_r e^{ir\omega t};$$

β is expressed in terms of η and t_1 . These equations lead to a system of transcendental equations in t_1 , i.e., to the equation of the periods. Stability of periodic solutions: System (3) is considered.

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Let $t = t_i$ be the time moments when the trajectory which corresponds to the periodic solution cuts the discontinuity surface. In order to apply Lyapunov's theorem, the equations of linear approximation are set up:

$$\Delta \dot{x}_i = \sum_k \left[\frac{\partial f_i}{\partial x_k} \right]_{x_i(t)} \Delta x_i ; \quad (i = 1, 2, \dots, n) , \quad (7)$$

supplemented by the linear "discontinuity conditions":

$$\Delta x_i^+ - \Delta x_i^- = \xi_i \sum_k h_k^- \Delta x^- = \xi_i \sum_k h_k^+ \Delta x^+ , \quad (8)$$

where

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$$h_k^+ = \left[\frac{\partial F_\alpha}{\partial x_k} / \left(\frac{\partial F_\alpha}{\partial t} \right)^{\pm} \right] M_\alpha$$

The authors studied the appearance of stable-equilibrium points on the discontinuity surface for system (3). Three theorems are formulated for the special case when the manifolds Γ^+ and Γ^- coincide without being contiguous to the slip region. These theorems involve the stability conditions for the special case. A discussion followed. There are 6 figures and 20 references: 19 Soviet-bloc and 1 non-Soviet-bloc.

Card 7/7

AYZENMAN, M. A. and LURYE, A. I.

"Methods for construction of periodic motions in piecewise-linear systems."

Paper presented at the Intl. Symposium on Nonlinear Vibrations, Kiev, USSR, 9-19 Sep 61

Politechnical Institute, Leningrad

Algorithmic non-solvability ...

26772
S/103/61/022/006/007/014
D229/D304.

it, a more restricted problem is formulated: A recursive function $\varphi(t)$ is supposed to be given which is fixed in the set of whole numbers and takes values belonging to a finite set $\{0, 1, \dots, r-1\}$. An automatic device A with input alphabet $\{\rho_0, \dots, \rho_{r-1}\}$ is considered. Of all possible input sequences the following ones are selected:

$\rho_{\varphi(0)}$, $\rho_{\varphi(0)} \rho_{\varphi(1)}$, $\rho_{\varphi(0)} \rho_{\varphi(1)} \rho_{\varphi(2)}$, etc.

$\rho_{\varphi(i)}$ being a symbol from $\{\rho\}$ the index of which coincides with the value of $\varphi(t)$ for $t = i$. An event: S^φ consists in the appearance of some one of the sequences selected above, at the input of A at a given moment. A is said to represent the function $\varphi(t)$ if it represents the event S^φ . The second Theorem is: The function $\varphi(t)$ can be represented by a finite automatic device if and only if $\varphi(t)$ is periodical above a certain value of t , i.e. there exist two numbers τ and T such that for any $t \geq \tau$ $\varphi(t + T) = \varphi(t)$. Proof of the theorem is given. The second theorem reduces the problem of

Card 2/3

AYZERMAN, M. A.

"Transformation of stages in sequential machines"

report submitted for the Intl. Symposium on Relay Systems and Finite Automata Theory (IFAC), Moscow, 24 Sep-2 Oct 1962.

AYZERMAN, M. A., and GANTIMAKHER, F. R.

"Problem of absolute stability of controlled systems in the list of works"

Report presented at the Conference on Applied Stability-of-Motion Theory and Analytical Mechanics, Kazan Aviation Institute, 6-8 December 1962

S/025/62/000/012/001/001
D201/D308

AUTHOR: Ayzerman, M.A. Doctor of Technical Sciences, Professor

TITLE: The machine is taught to recognize visual patterns

PERIODICAL: Nauka i zhizn', no. 12, 1962, 34-39

TEXT: A popular version is given of the paper read by the author at a meeting of the Otdeleniye biologicheskikh nauk AN SSSR (Department of Biological Sciences of the AS USSR) on biocybernetics, held in Moscow in April 1962. It presents the results of experimental work carried out under the leadership of the author by Engineers E.M. Braverman, O.A. Bashkirova and I.B. Muchnik at the author's laboratory and that on biocybernetics by Prof. S.N. Braynes of the Institut khirurgii imeni A.V. Vishnevskogo Akademii meditsinskikh nauk SSSR (Institute of Surgery im. A.V. Vishnevskiy of the Academy of Medical Sciences USSR). The author describes and defines the term 'visual pattern recognition', the compactness hypothesis as formulated by E.M. Braverman, the algorithm of 'random surfaces'

Card 1/2

AYZHEMAN, M. A. (Moskva); GUSEV, L. A. (Moskva); ROZONDER, L. I. (Moskva);
SMIRNOVA, I. M. (Moskva); TAL', A. A. (Moskva)

Conversion of the time pace of sequential machines and synthesis
of switching circuits. Avtom. 1 telem. 23 no.11:1465-1491
N '62. (MIRA 15:10)

(Electric relays) (Switching theory)
(Automatic control)

AYZKMAN, M. A.

"Learning processes in character recognition."

report to be submitted for the Conference on Problems of Cybernetics,
Karlsruhe, West Germany, 23-25 Apr 1963

AYZERMAN, M. A.

"Learning Systems of Automatic Control in the Light of Experiments
on Teaching Systems to Identify Images."

Paper to be presented at the IFAC Congress held in Basel, Switzerland,
27 Aug to 4 Sep 63.

AM4016855

BOOK EXPLOITATION

S/

Ayzerman, Mark Aronovich; Gantmakher, Feliks Ruvimovich

Absolute stability of control systems (Absolyutnaya ustoychivost' reguliruyemykh sistem) Moscow, Izd-vo AN SSSR, '63. 9138 p. illus., biblio., 5000 copies printed. (At head of title: Akademiya nauk SSSR. Institut avtomatiki i telemekhaniki.)

TOPIC TAGS: automatic control, absolute stability, control system absolute stability, frequency analysis of control, Lyapunov method, direct method, Popov criterion, Lur'ye resolvent equation method

PURPOSE AND COVERAGE: This book is devoted to a new approach to the theory of automatic control and its absolute stability, initiated by the Rumanian scientist V. M. Popov, and contains a systematic exposition of the main results, along with the point of view of the authors themselves regarding the present status of the problem. The book is intended for a large group of specialists interested in stability, and the mathematical approach is therefore somewhat simplified.

Card 1/2

AYZERMAN, Mark Aronovich; GUSEV, Leonid Alekseyevich; ROZONOER,
Lev Il'ich; SMIRNOVA, Irina Mikhaylovna; TAL', Aleksey
Alekseyevich; KOROLEV, N.A., red.; MURASHOVA, N.Ya.
tekhn. red.

[Logic. Automats. Algorithms] Logika. Avtomaty. Algoritmy.
Moskva, Fizmatgiz, 1963. 556 p. (MIRA 17:3)

AYZEMAN, M.A.; BRAVERMAN, E.M.; GLUSHKOV, V.M.; KOVALEVSKIY, V.A.;
LETICHEVSKIY, A.A.

Theory of image recognition and self-teaching systems. Izv.
AN SSSR. Tekh. kib. no.5:98-101 S.O '63. (MIRA 16:12)

L 11598-63

EWI(d)/BDS AFFTC/APGC/ASD Pg-4/Pk-4/P1-A/P0-4/Pq-4

IJPC(C)/BC

ACCESSION NR: AP3001082

S/0103/63/024/006/0732/0737

74

AUTHOR: Ayzerman, M. A. (Moscow); Gantmakher, F. R. (Moscow)

TITLE: On critical cases in the theory of absolute stability of control systems

SOURCE: Avtomatika i telemekhanika, v. 24, no. 6, 1963, 732-737

TOPIC TAGS: control system, absolute stability, critical case, limiting stability, control system stability

ABSTRACT: Popov's criteria of absolute (global) stability are applied to a control system described by the equation

$$\frac{dx}{dt} = Ax + by, y = \varphi(\sigma), \sigma = c'(x), \quad (1)$$

where x, y are column vectors and c' is a row vector; A is a constant square matrix, all the eigen-values of which are located on the left hand side of the imaginary axis; and $\varphi(\sigma)$ is a continuous scalar function satisfying the condition $0 = \varphi(\sigma)/\sigma \leq k$, where k is a finite number. These criteria, previously applied

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to noncritical cases, are realized here for all critical cases by narrowing down the class of characteristic functions $y = \varphi(\sigma)$ by inequality

$$\varepsilon \leq \frac{\varphi(\sigma)}{\sigma} \leq k, \quad (2)$$

where ε is an arbitrarily small positive number. The general criterion of absolute stability is formulated in the following theorem: For the absolute stability of system (1) in any critical case when $\varphi(\sigma)$ satisfies inequality (2), it is sufficient to satisfy the Popov inequality

$$\operatorname{Re}(1 + iq\omega) W(i\omega) + 1/k > 0 \quad (3)$$

for any finite real q and for all real ω and to satisfy the condition of "limiting stability," i.e., to make stable the linear system derived from (1) at $y = \varepsilon\sigma$ for any small $\varepsilon > 0$. Necessary and sufficient conditions which the frequency characteristic $W(i\omega)$ must satisfy to secure the "limiting stability" of a linear systems are formulated, and the proof of the theorem is presented.

Cord 2/3

AYZENMAN, M.A., doktor tekhn. nauk, prof., otv. red.; FUDIM,
Ye.V., red.izd-va; KISELEVA, A.A., tekhn. red.;
MATYUKHINA, L.I., tekhn. red.

[Pneumatic and hydraulic control] Pnevmo- i gidroavtomatika.
Moskva, Izd-vo "Nauka," 1964. 262 p. (MIRA 17:4)

1. Akademiya nauk SSSR. Institut avtomatiki i telemekhaniki.

AYZERMAN, M.A. (Moscow)

"Dynamical problems of finite system theory .. finite automata"

report presented at the 2nd All-Union Congress on Theoretical and Applied
Mechanics, Moscow, 29 January - 5 February 1964

KHRAMOY, A.V. [deceased]; MEYEROV, M.V.; AYZERMAN, M.A.; ULANOV, G.M.;
TSYPKIN, Ya.Z.; FEL'DBAUM, A.A.; LERNER, A.Ya.; PUGACHEV, V.S.;
IL'IN, V.A.; GAVRILOV, M.A.

Work of the Institute of Automatic and Remote Control
on the development of the theory of automatic control during
1939-1964. Avtom. i telem. 25 no. 5:763-807 Je '64.
(MIRA 17:7)

ACCESSION NR: AF4041467

S/0103/64/025/006/0917/0936

AUTHOR: Ayzerman, M. A. (Doctor of technical sciences) (Moscow); Braverman, E. M. (Moscow); Rozonoer, L. I. (Moscow)

TITLE: Theoretical basis of the method of potential functions in the problem of teaching the automata to classify input situations

SOURCE: Avtomatika i telemekhanika, v. 25, no. 6, 1964, 917-936

TOPIC TAGS: automatic control, pattern recognition, perceptron, potential function

ABSTRACT: Automata are considered which recognize the class of a situation (yes, no, analog or digital computer output, characteristics, etc.) applied to their input. The set of situations that may occur at the automaton input is limited by a selected space X and a class $\psi(x)$ of functions describing the situations. Algorithms for teaching automata how to recognize the classes of input situations

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L 14371-6 EWT(d)/T/EED-2/EWP(1) No-4/Pk-4/Pg-4/Pk-4 IJP(c) BB/GO
 ACCESSION NR: AP4045343 S/0103/64/025/009/1307/1323

AUTHOR: Ayzeman, M. A.; Braverman, E. M.; Rozonoer, L. I.

TITLE: Probabilistic problem on teaching automata recognition of classes by the method of potential functions

SOURCE: Avtomatika i telemekhanika, v. 25, no. 9, 1964, 1307-1323

TOPIC TERMS: ^{6c} pattern recognition problem, automata teaching, potential function method, learning automaton

ABSTRACT: The probabilistic approach to teaching automata to separate input situations into classes A and B is presented. It is assumed that the set of all situations at the input of an automaton form a space X and that probabilities $D_a(x)$ and $D_b(x) = 1 - D_a(x)$ of the point x belonging to the class A or B, respectively, are functions defined on the space X. Functions $D_a(x)$ and $D_b(x)$ are called the degree of certainty of the point x belonging to class A or B. The problem consists in determining $D_a(x)$ and $D_b(x)$ on the entire space X from the points obtained during the learning process as well as from the information to which class (A or B) they are referred.

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L 14371-6

ACCESSION NR: AP4045343

Under the assumption that sets A and B intersect and that $D_a(x)$ and $D_b(x)$ can be expanded in finite series in a certain system of orthonormalized functions, the algorithm for constructing the function $\phi_1(x)$ which approximates $D_a(x)$ and $D_b(x)$ is presented on the basis of the method of potential functions developed earlier by the authors (Avtomatika i telemekhanika, v. 25, no. 6, 1964). It is shown that $\phi_1(x)$ is a random function, and it is proved that when i increases it converges to $D_a(x)$. The realization of the algorithm on a general purpose digital computer is considered. Orig. art. has: 67 formulas.

ASSOCIATION: none

SUBMITTED: 13Feb64

ENCL: 00

SUB CODE: NA

NO REF SOV: 004

OTHER: 000

Card 2/2

L 19481-65 ESD(dp)

ACCESSION NR: AP0001762

S/0103/04/025/012/1705/1714 ^B

AUTHOR: Ayzerman, M. A. (Moscow); Braverman, E. M. (Moscow); Rozonoer, L. I. (Moscow)

TITLE: The method of potential functions in the problem of generating the characteristic of a functional converter from random observations

SOURCE: Avtomatika i telemekhanika, v. 25, no. 12, 1964, 1705-1714

TOPIC TAGS: potential function method, converter characteristic generation, functional converter, function generation algorithm

ABSTRACT: The problem of generating the unknown function

$$y = f(x_1, x_2, \dots, x_n) \quad (1)$$

from the finite number of random inputs $x_1, \dots, x_n$ and the corresponding outputs y is analyzed. Recently, this problem turned out to be very important in connection with the synthesis of self-adjusting systems which is based on the generation of plant characteristics

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L 19481-65

ACCESSION NR: AP5001762

during the control process. From the mathematical point of view, this is an ordinary interpolation problem, but solving it by the ordinary methods of the theory of interpolation is difficult. The authors propose the method of potential functions developed earlier (Avtomatika i telemekhanika, v. 25, nos. 6 and 9, 1964) for the solution of this problem. Assuming that there exists an orthonormal system of functions $\phi_1(x), \dots, \phi_k(x)$ such that function (1) can be represented by a finite series

$$f(x) = \sum_{j=1}^k c_j \cdot \phi_j(x), \quad (2)$$

and utilizing the potential function of the form

$$K(x, y) = \sum_{j=1}^k \phi_j(x) \phi_j(y), \quad (3)$$

two algorithms for constructing the sequence of functions $f_i(x)$ are presented. The convergence of the sequence $f_i(x)$ toward the

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ACCESSION NR: AP5001762

function (1) when $i + \alpha$ is proved. The proposed algorithms can be realized on computers. These algorithms were applied to the solution of a system of algebraic equations. This application shows that the algorithms derived here can be utilized in solving certain problems of computational mathematics. The modification of the derived algorithms for generating convex characteristics in the presence of noise is considered. Orig. att. has: 34 formulas.

ASSOCIATIONS: none

SUBMITTED: 11Apr64

ENCL: 00

SUB CODE: MA

NO REF SOV: 004

OTHER: 003

ATD PRE: 3: 3159

Cord 3/3

L 24340-66 EEC(k)-2/EWT(d)/EWT(1)/EWP(v)/EWP(k)/EWP(h)/EWP(1)/EWA(h)
ACCESSION NR: AT6005899 SOURCE CODE: UR/0000/85/000/000/0049/0053

IJP(c) BC/GS

AUTHOR: Ayzernian, M. A.; Tal', A. A.

ORG: None

TITLE: New developments in pneumatic automation 9

SOURCE: International Federation of Automatic Control. International Congress. 2d,
Basel, 1963. Tekhnicheskiye sredstva avtomatiki (Technical means of automation); trudy
kongressa. Moscow, Izd-vo Nauka, 1965, 49-53

TOPIC TAGS: pneumatic control, pneumatic control system, automatic pneumatic control,
automatic control theory

ABSTRACT: The author discusses new developments in pneumatic automation, stressing
the breakthrough achieved recently. This breakthrough puts pneumatic automation on a
new plane in the range of operating frequencies, ease of selection and assembly of various
circuits, and opportunity of satisfying all the growing needs of industry. Three technical
ideas are the basis of this breakthrough: 1) the application of low working pressure; 2)
the design of pneumatic automatic devices and systems from unified components which use
"printed" circuits; and 3) the design of pneumatic devices which use the effects of the
direct interaction of flow (without any intermediate or elastic components) with the
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ACCESSION NR: AT6005899

application of the printed circuit technique. Each idea is discussed briefly. The brief review presented shows that the three technical ideas examined have radically changed the opportunities available to pneumatic automation and its role in the general aspect of the development of automation. As a result of high reliability, fire and explosion safety, simplicity, and low cost, as well as low sensitivity to the changes occurring in the surroundings (particularly the temperature), pneumatics is a valuable supplement, and sometimes a replacement, for electronics in all fields requiring higher standards in rapid response and long distances. Orig. art. has: 4 figures.

SUB CODE: 13/ SUBM DATE: 23June65/ ORIG REF: 006/ OTH REF: 004

Card 2/11

PB

L 04838-67 EWP(k)/EWI(d) EWP(h)/T/EWP(l) EWP(v) LSP(c) GS/RS GD
 ACC NR: AT6016444 (A) SOURCE CODE: UR/0000/65/000/000/0481/0493

AUTHOR: Ayzerman, M. A.

ORG: none

TITLE: The problem of teaching automats to divide input situations into classes (Image recognition) *56*
50
B+1

SOURCE: ¹⁴International Federation of Automatic Control. International Congress, 2d, Basel, 1963. Diskreinye i samonastroyayushchiyesya sistemy (Discrete and adaptive systems); trudy kongressa. Moscow, Izd-vo Nauka, 1965, 481-493

TOPIC TAGS: pattern recognition, automatic machine teaching, automatic control theory

ABSTRACT: In the learning systems of control which are being widely used in modern technology learning generally means the gradual improvement of system operation under certain operating conditions, or the capacity of the system to change its adjustment as operating conditions change. "Payment" and "penalty" signals which evaluate the system's work are emitted by a human operator or another automaton to adjust the dynamic characteristics of the system. This report discusses experiments made in the laboratory supervised by the author at the

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L 27896-66	EWI(d)/T	IJP(c)	SOURCE CODE: UR/0103/65/026/011/1951/1954
ACC NR: AP5027888			
AUTHOR: <u>Ayzerman, M. A. (Moscow); Braverman, E. M. (Moscow); Rozonoer, L. I. (Moscow)</u>			
ORG: none			
TITLE: The Robbins-Monro process and the method of <u>potential functions</u>			
SOURCE: Avtomatika i telemekhanika, v. 26, no. 11, 1965, 1951-1954			
TOPIC TAGS: Robbins Monro process, potential functions method			
ABSTRACT: Ya. Z. Tsypkin has shown (Avtomatika i telemekhanika, v. 26, no. 11, 1965, 1951-1954) that two of three algorithms for determining the characteristics of the functional generator on the basis of a finite number of randomly observed values presented by the authors of this article (Avtomatika i telemekhanika, v. 25, no. 12, 1964, 1705-1714) can be obtained by the Robbins-Monro method (the method of stochastic approximations). In the article, the authors analyze the interconnection between the method of potential functions and the Robbins-Monro process. They agree that, apparently, all problems to whose solution the method of potential functions has been applied can be reduced to the solution of a system of equations. However, this fact, in general, does not indicate that the Robbins-Monro process is applicable, or if applicable, that it is expedient. The following two statements are formulated: 1) Even in those cases when the problem can be reduced to the solution of a system of equations, the algorithms of the method of potential functions often can not be reduced to the			
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Robbins-Monro process; in addition, in many cases, these algorithms provide a more effective procedure (in the sense of the rate of convergence) for solving the system of equations. 2) Even in those cases when the Robbins-Monro process can be formally applied to the solution of the problem, the convergence of this procedure can constitute another, independent problem. A detailed substantiation of these statements is presented. Orig. art. has: 8 formulas. [LK]

SUB CODE: MA/ SUBM DATE: 23Jul65/ ORIG REF: 005/ (YTH REF: 004/ ATD PRESS: 4133

Card 2/2

CC

ACC NR: AT6022668

SOURCE CODE: UR/0000/66/000/000/0003/0008

AUTHOR: Ayzerman, M. A.; Braverman, E. M.; Rozonov, L. I. (Doctor of technical sciences)

ORG: none

TITLE: The problem of teaching machines to recognize external situations

SOURCE: Moscow. Institut avtomatiki i telemekhaniki. Samoobuchayushchiyesya avtomaticheskiye sistemy (Self-instructing automatic systems). Moscow, Izd-vo Nauka, 1966, 3-8

TOPIC TAGS: intelligent machine, pattern recognition, character recognition, artificial intelligence, perceptron, *teaching machine*

ABSTRACT: A method for machine recognition of external stimuli, based on so-called *potential functions*, is proposed in this paper dealing with artificial intelligence. Individuals can recognize events and patterns, and teach others to do so, frequently without being able to explain *how* the process of recognition comes about. For instance, an illiterate person can be shown letters "a" and "b" and taught to recognize these letters irrespective of their shape. This process of information transfer is therefore based not on explanation, but on demonstration. This technique can be applied to learning, pattern-recognition machines, designed to respond to audio or visual com-

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ACC NR: A16022668

Then a potential function can be considered, given by

$$K(x, x^*) = \sum_{i=1}^{\infty} \lambda_i^2 \varphi_i(x) \varphi_i(x^*),$$

This function is valid anywhere in space X . Assigning positive values for the region A and negative values for the region B , the general potential field can be constructed in accordance with

$$K_1(x) = \begin{cases} K(x, x^{(i)}), & \text{if } x^{(i)} \in A \\ -K(x, x^{(i)}), & \text{if } x^{(i)} \in B, \end{cases}$$

Theorem 1: If there exists a function $\psi(x)$ which strictly separates sets A and B , i.e.,

$$\begin{aligned} \psi(x) &> \epsilon, & \text{if } x \in A; \\ \psi(x) &< -\epsilon, & \text{if } x \in B, \end{aligned}$$

where $\epsilon > 0$, and which satisfies the main hypothesis, then irrespective of the nature of the point sequence from A and B , only a finite number of errors, smaller than some number m , will occur during the recognition of this sequence. *Theorem 2:* Let p be the probability of the automaton making an error after the learning phase has been completed. Assuming that the conditions of *Theorem 1* are satisfied, that the statistics of recognition are such that recognitions are independent, and that for both re-

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AYZIKOVICH, B.N.; GRONDA, V.I., red.; BARANOV, Yu.V., tekhn. red.

[Laboratory work on the course "Allowances, Fits, and
Technical Measurements" for technical schools] laborator-
nye raboty po kursu "Dopuski, posadki i tekhnicheskie iz-
mereniia" dlia mashinostroitel'nykh tekhnikumov. [n.p.]
Mosvuzizdat, 1963. 76 p. (MIRA 17:3)

AYZIMOV, D., inzh.

Tipping forms for making reinforced concrete products. Stroitel'
no.7:12 JI '58. (MIRA 11:9)
(Concrete construction--Formwork)

AYZIKOV, D., inzh.

Unit for making multihollow reinforced concrete slabs, Stroitel'
no. 3:11 Mr '59. (MIRA 12:6)

(Concrete slabs)

AYZIKOV, D.S.

Form for manufacturing multihollow ceiling and floor panels.
Transp. stroi. 9 no.4:36-37 Ap '59. (MIRA 12:6)

1. Nachal'nik uchastka mostootryada No.2.
(Concrete slabs)

AYZIKOV, D.S., inzh.

Making rectangular hollow piles in tipping forms. Transp.stroi. 9
no.6:55-56 Je '59. (MIRA 12:11)

(Piling (Civil engineering))

AYZIKOV, D.S.

Tipping forms for making elements of fences and railings.
Transp.stroi. 10 no.3:53-54 Mr '60. (MIRA 13:6)

1. Nachal'nik uchastka mostostroyada No.2 mostostroya No 1.
(Concrete construction--Formwork)

AYZIKOV, D.S.

New method of manufacturing a reinforced concrete sheet pile.
Transp. stroi. 12 no.4:50-51 Apr '62. (MIRA 15:5)

1. Nachal'nik uchastka mostostroyaniya No.2 Mostostroya No.1.
(Precast concrete) (Piling (Civil engineering))

AYZIKOV, D.S.

Erection of a reinforced concrete span 52.3 m. long with dry joints. Transp. stroi. 12 no.12:16-19 'D '62,, (MIRA 16:1)

1. Nachal'nik uchastka mostootryada No.2 Mostostroya No.1.
(Kiev—Bridge construction)

AYZIKOV, D.S.

New method of forming channels. Transp. stroi. 12 no.1:52
Ja '62. (MIRA 17:2)

LUPALO, I.G.; AYZIKOV, D.V.; KOSTRIKINA, Z.I.; YUKHVETS, M.A.; VERKHOVTSYEV,
I., red.; DANILINA, A., tekhn.red.

[Builders of socialism tell their stories; reminiscences of some
workers who built socialism in the U.S.S.R.] Goveriat stroiteli
sotsializma; vospominaniia uchastnikov sotsialisticheskogo stroi-
tel'stva v SSSR. Moskva, Gos.izd-vo polit.lit-ry, 1959. 415 p.
(MIRA 13:3)

(Russia---Industries)

(Efficiency, Industrial)

AYZIKOV, P.S.

Experience in the automatization of heating at the old coke-oven
battery. Koks i khim. no.4:49-51 "60. (MIRA 13:6)

1. Kramatorskiy koksokhimicheskiy zavod.
(Kramatorsk--Coke ovens) (Heat engineering)

AYZIKOV, E. I., UDOVENKO, V. V., AZIZOV, M. A.

"The Reactions of Anabesine With Mercurous and Mercuric Chlorides"
Dokl. AN UzSSR, No 5, 1953, pp 38-41

Describes some of the reactions of anabesine with mercurous and mercuric chlorides. (RZhKhim, No 10, 1954)

SO: W-31187, 8 Mar 55

AVZIKAV. FET

Reaction of halogen atoms of cobalt with anhydride. Y.
Udovnikov and B. I. Lukov. J. Gen. Chem. U.S.S.R.
5: 231-11 (1953) (English translation).—See C.A. 50
531. M.R.

CM

AYZIKOV,

E.I.

Reaction of halogen salts of cobalt with anhydrous V.V.
 Udoventko and U. I. Aizikov, Zh. Obshch. Khim. 28,
 2135-7 (1954); cf. U.S. 4, 1344. -- Mixing anhydrous with
 CoCO_3 in appropriate halogen acids yielded the following
 salts: $\text{CoBr}_2 \cdot \text{CoCl}_2 \cdot 2\text{H}_2\text{O}$, blue solid, decamp. 180° (from H_2O); $\text{CoBr}_2 \cdot$
 $\text{CoI}_2 \cdot 2\text{H}_2\text{O}$, blue solid, decamp. 180° (from H_2O); Co
 $\cdot \text{CoI}_2 \cdot 2\text{H}_2\text{O}$, green solid, decamp. 270° (from H_2O);
 $\text{CoI}_2 \cdot \text{CoI}_2 \cdot 2\text{H}_2\text{O}$, yellow-green, decamp. 230°. Co is
 pptd. from these salts by H_2S , while all halide is pptd. by
 AgNO_3 . (S. M. Kozlovskii ...)

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5(4)

SOV/78-4-2-18/40

AUTHORS: Ayzikov, E. I., Udovenko, V. V.

TITLE: The Interaction of Anabasine With Thiocyanates of the Iron Subgroup (Vzaimodeystviye anabazina s rodanistymi solyami podgruppy zheleza)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 2, pp 356-358 (USSR)

ABSTRACT: The interaction of thiocyanates of the iron subgroup with anabasine in the presence of thiocyanic acid was investigated. Compounds of nickel, cobalt, and iron with the composition $\text{Me}(\text{CNS})_2 \cdot 2^{20}\text{C}_{10}\text{H}_{14}\text{N}_2 \cdot 2\text{HCNS}$ were produced by using the Burkat method. The cobalt compound crystallizes with 4 molecules water unlike the respective compounds of nickel and iron. The syntheses of these compounds are described in detail. All compounds formed are soluble in water; iron salt shows the best solubility, nickel salt the least. The aqueous solutions of iron salt are dark green, those of cobalt salt pink, and those of nickel salt light green. The molecular electric conductivity and the pH value were determined in solutions of

Card 1/2

SOV/78-4-2-18/40

The Interaction of Anabasine With Thiocyanates of the Iron Subgroup

various concentrations. The results are shown in table 1. The results show that all the compounds obtained dissociate incompletely in aqueous solutions. The formation of the combination-type $\text{Me}(\text{CNS})_2\text{Bas} \cdot 2\text{HCNS}$ (Bas - organic base) with metals of the iron subgroup does not depend on the basicity of the organic base. There are 1 table and 6 references, 4 of which are Soviet.

ASSOCIATION: Kiyevskiy politekhnicheskii Institut (Kiyev Polytechnic Institute)

SUBMITTED: December 6, 1957

Card 2/2

AYZIKOV, G.S. (Moskva 1-412, Sadovyy prymol, d.4)

Diagnosis of the initial degree of contracture of the muscle stretching the fascia lata. Ortop., travm. i protez. 20 no.2: 60-63 F '65. (MIRA 18:5)

1. Iz kliniki vosstanovitel'nogo i rezidual'nogo periodov polio-miyelita (zav. - prof. M.S.Zhukhovitskiy) Instituta polio-miyelita AMN SSSR (dir. - deystvitel'nyy chlen AMN SSSR prof. M.P.Chumakov) na baze Khovrinskoy bol'nitsy.

Ayzikov P.S.

AUTHORS: Mamatov, A.D. and Ayzikov, P.S.

68-58-2-6/21

TITLE: A New Method of Measuring the Temperature Along the Axis of Coke in an Oven (Novyy metod izmereniya temperatur po osi koksovogo piroga)

PERIODICAL: Koks i Khimiya, 1958, Nr 2, pp 36 - 37 (USSR)

ABSTRACT: As the durability of thermocouples used for measuring temperatures in the tar-line plane is low and, in particular, of those reaching deep into the charge, these were replaced by tubes with conical bottoms (Fig.1) and the temperatures are read with an optical pyrometer. The tubes are placed into position through special holes in the lids of charging holes 7 - 8 hours after the beginning of coking (Fig.2) and removed when the required temperature is reached. A good agreement between the temperatures measured by this method and with thermocouples (+ 10 - 30 °C) is claimed (table). There are 2 figures and 1 table.

ASSOCIATION: Kemerovskiy koksokhimicheskiy zavod
(Kemerovo Coke Oven Works)

AVAILABLE: Library of Congress
Card 1/1

1. Coke - Preparation - Equipment
2. Coke ovens - Temperature - Measurement
3. Optical pyrometers - Applications

POKROVSKIY, P.V.; GRIGOR'YEV, N.A.; POTASHKO, K.A.; AYZIKOVICH, A.N.

Moraesite from the Urals. Zap.Vses.min.ob-va. 92 no.2:232-239
'63. (MIRA 16:5)

1. Institut geologii Ural'skogo filiala AN SSSR i Ural'skoye
geologicheskoye upravleniye.
(Ural Mountains—Moraesite)

AUTHOR		TITLE		SUBJECT		CLASSIFICATION		NOTES	
ALTSHTEIN, L.		PROCESSES AND PROPERTIES							
Q 4								9	
The production of ingots for the Mannesmann process at the Stalin iron works in Dordans. I. Braun and L. Altshtein. <i>Metallurg</i> 12, No. 3, 41 (1938). <i>Chem. Zentr.</i> 1939, 1, 2280. Charging and smelting procedure in a 100-metric ton Martin furnace, decarburization and quieting of the bath, casting of the ingots, heating and rolling, material rejected in the grading, and the macro- and microstructures of the finished pipes are reported. There was less waste (rejected material) in pipes produced from quiet steel than for those cast from an unquiet bath. In order to obtain a fine grain about 0.1% Al must be added in the ladle for the decarburization of the steel. The grain size depends on the addn. of Al and on the type of smelting procedure employed, which must be such as to assure a completely decarburized steel. M. G. Moore									
ASH 55.4 METALLURGICAL LITERATURE CLASSIFICATION									

AYZIKOVICH, L. Ye.

[Technology of wheat and rye milling] Tekhnologiya proizvodstva
pechenichnoi i rshanoi muki. Moskva, Zagotizdat, 1954. 520 p.
(MIRA 8:1D)

[YE]
AYZIKOVICH, L., kandidat tekhnicheskikh nauk

Methods improving mill operation. Muk.-elev.prom. 21 no.4:
19-22 Ap '55. (MIRA 8:7)

1. Moskovskaya mel'nitsa no.2
(Grain milling)

AYZIKOVICH, L., kandidat tekhnicheskikh nauk

Ways and means of improving the dusting of bran in milling high-grade flour. Muk.-elev.prom.21 no.8:18-20 J1[Ag] '55.
(MLRA 8:12)

1. Vsesoyuznaya shkola krupchatnikov
(Grain milling)

AYZIKOVICH, L., kandidat tekhnicheskikh nauk; NAYDIN, L.

Vertical machine for finishing bran. Muk.-elev.prom. 22 no.6:18-19
Je '56. (MIRA 9:9)

1.Moskovskaya shkola krupchetnikov.
(Grain-milling machinery)

AYZIKOVICH, Leonid Yefimovich, kand. tekhn. nauk; KHORTSIN, Boris Nikolayevich,
inzh.; GEL'MAN, D.Ya., red.; GOLUBKOVA, L.A., tekhn. red.

[Development of flour milling technology in the U.S.S.R.; a brief
account] Razvitie tekhnologii mukochnogo proizvodstva v SSSR;
kratkii ocherk. Moskva, Izd-vo tekhn. i ekon. lit-ry po voprosam
mukochno-krupianoi i kombikormovoi promyshl. i elevatorno-
skladskogo khoziaistva, 1957. 92 p. (MIRA 11:7)
(Grain-Milling machinery)

AYZIKOVICH, Leonid Yefimovich, kand.tekhn.nauk; KHORTSEV, B.N., glavnyy inzh., red.; UST'YAN, D.Ya., red.; GOLUBKOVA, L.A., tekhred.

[Increasing the efficiency of bran finishing at mills producing high-grade flour; using propeller-type machines in the break system instead of roller mills] Povyshenie effektivnosti vymola obolochek zerna na sortovykh mel'nitsakh; opyt zameny val'tsevykh stankov propellernymi mashinami na poslednikh dranykh sistemakh. Pod red. B.N.Khortseva. Moskva, Izd-vo tekhn. i ekon.lit-ry po voprosam mukomol'no-krupyanoi promyshl. i elevatorno-skladskogo khoz., 1957. 100 p. (MIRA 12:9)

1. Upravleniye mukomol'no-krupyanoy i kombikormovoy promyshlennosti Ministerstva khleboproduktov SSSR (for Khortsev). (Grain-milling machinery)

AYZIKOVICH, Leonid Yefimovich, kand.tekhn.nauk; GROSS, Konstantin
Prokof'yeovich, inzh.; MAKSIMCHUK, Boris Mikhaylovich, inzh.;
KOCHETKOV, L.I., red.; GOLUBKOVA, L.A., tekhn.red.

[Mills with pneumatic equipment; assembling, adjusting and
operating] Pnevmaticheskaya mel'nitsa; opyt montazha, naladki i
ekspluatatsii. Moskva, Izd-vo tekhn.i ekon.lit-ry po voprosam
mukomol'no-krupianoj, kombikormovoi promyshl. i elevatorno-
skladsogo khoziaistva, 1957. 171 p. (MIRA 11:1)
(Flour mills) (Pneumatic-tube transportation)

AYZIKOVICH, Leonid Yefimovich, kand.tekhn.nauk; AUERMAN, I.Ya., prof.,
dokto:: tekhn.nauk, red.; SAMOYLOVA, G.V., red.; GOLUBKOVA, L.A.,
tekhn.red.

[Technological properties of wheat and quack grass hybrids]
Tekhnologicheskie svoistva pshenichno-pyreinykh gibridov.
Moskva, Zagotizdat, 1961. 215 p. (MIRA 14:12)
(Hybridization, Vegetable) (Wheat)
(Quack grass)

AYZINOVICH, L.Ye.; MAKSIMCHUK, B.M.

Automation of a flour mill. Mekh.i avtom.proizv. 15 no.9:50-52
S '61. (MIRA 14:11)

1. Direktor Moskovskogo mel'nichnogo zavoda No.2 "Novaya pobeda"
(for Ayzikovich). 2. Zamestitel' glavnogo inzhenera Moskovskogo
mel'nichnogo zavoda No.2 "Novaya pobeda" (for Maksimchuk).
(Moscow—Flour mills)
(Automation)

AYZIKOVICH, L., kand.tekhn.nauk; MAKSIMCHUK, B., inzh.

Production of rye flour in Poland. Muk.-elev. prom. 29 no.11:22-24
N '63. (MIRA 17:2)

1ST AND 2ND COPIES										3RD AND 4TH COPIES									
PROCESSING AND PROPERTIES INDEX																			
Abstract A new synthesis of bisacetylene glycols. Yu. S. Zal'kind and N. A. Alzhovich—<i>J. Gen. Chem.</i> (U. S. S. R.) 7, 227-33 (1977). cf. <i>C. A.</i> 30, 2832¹.—In a previous study of the condensation of monosubstituted acetylenes in the presence of $\text{CuCl} + \text{NH}_4\text{Cl}$ acidified with HCl, it was found that $\text{PhC}\equiv\text{CH}$ gives diphenylbisacetylene. The application of this reaction to the synthesis of bisacetylene glycols, according to the scheme: $2 \text{RR}'\text{C}(\text{OH})\text{C}\equiv\text{CH} \rightarrow [\text{RR}'\text{C}(\text{OH})\text{C}\equiv\text{C}]_2 + \text{H}_2$. Thus, $\text{Me}_3\text{C}(\text{OH})\text{C}\equiv\text{CH}$ (II) gave $[\text{Me}_3\text{C}(\text{OH})\text{C}\equiv\text{C}]_2$ (III) and 1-hydroxycyclohexylacetylene (IV) gave bis-(1-hydroxycyclohexyl)bisacetylene (V). I, b. 103.5-4°, d_4^{20} 0.8852, n_D^{20} 1.4202, M. R. 24.58 (calcd. 24.81) (cf. Pavorakil, U. S. S. R. pat. 31,017), (2 g.) was introduced into 2 g. CuCl and 6 g. NH_4Cl in 25 cc. H_2O at room temp. The reaction was completed in 3-5 min., giving 100% II, m. 132-135° (C_6H_6). II in EtOAc hydrogenated in the presence of Pt black added 8 H atoms, forming 2,7-dimethyloctane-1,7-diol, m. 82-9° (ligroin), 57-9° (H_2O) (cf. Zelinskii, <i>J. Russ. Phys.-Chem. Soc.</i> 36, 901 (1906)). The reaction proceeds without the usual addn. of HCl and gives equally good results in the absence of NH_4Cl and with NH_4OH soln. of Cu_2O. Since the reaction affords 100% II without the pptn. of Cl_2 and evolution of a gas, it might be assumed that the atm. O_2 acts as an acceptor of the H_2 liberated in the reaction. In fact, the reaction in a H atm. proceeds very slowly, giving after 1 hr. but few crystals of II. In an atm. of pure O_2, the condensation takes place very rapidly with a decrease of the O_2 vol. corresponding to the amt. required for oxidizing CuCl to Cu_2O and the H_2 liberated in the reaction. III, b. 99-101°, d_4^{20} 0.8608, n_D^{20} 1.4750, M. R. 30.17 (calcd. 30.47), obtained by the Rupe method (<i>C. A.</i> 22, 2628), was contaminated with about 8% cyclohexanol. IV, m. 173-4° (C_6H_6), resulted in nearly 100% yield from 3.1 g. III and 3 g. CuCl and 9 g. NH_4Cl in 30 cc. H_2O. The reaction is completed at room temp. in 20-5 min. in O_2 and in 2-3 hrs. in air. In N an insignificant amt. of IV resulted after 12 hrs. of interaction. The condensation of III in the presence of Cu_2O in NH_4OH gave 62.5% IV. Hydrogenation of 2 g. IV with 2 g. Pt black resulted in the addn. of 12 H atoms and formation of α,β-dicyclohexylbutane, b. 109°, and with 0.6 g. Pt black in bis(1-hydroxycyclohexyl)-1,3-butane. Chas. Blane.																			
AS 11-51A METALLURGICAL LITERATURE CLASSIFICATION																			
EXAMINER'S REPORT																			
RESEARCHER'S REPORT																			

The synthesis of an alcohol with two conjugated triple bonds. Yu. S. Zal'kind and M. A. Alizkovich, *J. Gen. Chem.* (U. S. S. R.) **9**, 961-4 (1939).—On heating 10 g. 2,7-dimethyl-3,5-octadiene-2,7-diol with 20 g. Ca(OH)₂ at 75–83° C., it is cleaved, giving a mixt. of Me₂C=CH-C≡C-CH(CH₃) (I). The main results were obtained by using K₂CO₃ or Ba(OH)₂. However, on heating the above reaction for only 30 min., i. e., terminating the reaction before its completion at 120–30°, 17% (theory) of I was obtained. In this case, 40.5% of alcohol was recovered. *b_p* 50–61°, *b_m* 72–4°, *d*₄²⁰ 0.9395, *n*_D²⁰ 1.4820, *M_{RD}* = 33.00. Since I is not very stable, it was ex- 7
tracted from the reaction mixt., after distg. off most of the biacetylene and Me₂CO, by NH₃-Ag₂O soln. and the resulting ppt. was decoupled (cold) with 20% H₂SO₄ under an Et₂O layer (several days required). The I formed immediately dissolved in the Et₂O layer, and was removed from it in the usual manner. Biacetylene: glycals with 2 conjugated triple bonds on reacting with K₂CO₃, Ca(OH)₂, or Ba(OH)₂, decomp., forming 2 mols. of ketone and biacetylene or 1 mol. of ketone and biacetylene alc. 9

A. A. Podgornyy

AYZIKOVICH, N.A.

Apparatus for sublimation of the large quantities of organic substances (benzoic acid, naphthalene and others) using an aluminum sublimator. Trudy VNIIM no.5:60-64 '47.

(MIHA 12:1)

(Sublimation (Physical sciences)) (Chemical apparatus)

AUTHORS: Ayzikovich, M. A., Maretina, I. A., SOV/79-28-11-32/55
Petrov, A. A.

TITLE: Catalytic Hydration of Vinyl Ethylene Oxide (Kataliti-
cheskoye gidrirovaniye viniletilenoksidov) I. Hydration
of Divinyl Oxide (I.Gidrirovaniye okisi divinila)

PERIODICAL: Zhurnal obshchey khimii, 1958, Vol 28, Nr 11,
pp 3046 - 3051 (USSR)

ABSTRACT: Continuing earlier investigations on the inter-
dependence between the order of affiliation of
various compounds to the organic α -oxides, their
structure, as well as the acid and basic properties
of the reagents or catalysts (Ref 1) the authors
carried out further experiments on the affiliation
of hydrogen to the α -oxides. The hydration of the
 α -oxides of the type of vinyl ethylene oxide raised
greatest interest as far as a formation of affiliation
products in the position 1,4 could be expected,
at least according to references 1 and 7. In the
present paper the results of the catalytic hydration

Card 1/3

Catalytic Hydration of Vinyl Ethylene Oxide. I.
Hydration of Divinyl Oxide

SCV/79-28-11-32/55

of divinyl oxide on palladium, platinum, and nickel are described. The velocity and the catalytic reaction process of the hydration of divinyl oxide (1,2-epoxy butene-3) were investigated. It was found that the oxide ring is hydrated more rapidly than the double bond. The primary alcohol was obtained from the complete hydration of divinyl oxide; thus, it was proved that the opening of the oxide ring takes place mainly on the side of the secondary carbon atom, which fact is in contrast to the Markovnikov theorem. It was shown that in the hydration process the affiliation of the hydrogen takes place in the position 1,4 of the binding system $C=C-C-O-C$ under the formation of crotyl alcohol, the intermediate product of the hydration. The intermediate formation of the oxides of oxonium compounds is assumed in the catalytic hydration; this tends to show a hydrogen affiliation, which is not in agreement with the Markovnikov theorem. There are 3 figures, 2 tables, and 11 references, 7 of

Card 2/3

Catalytic Hydration of Vinyl Ethylene Oxide. I.
Hydration of Divinyl Oxide .

SOV/79-28-11-32/55

which are Soviet.

ASSOCIATION: Leningradskiy tekhnologicheskii institut imeni Lensovet
(Leningrad Technological Institute imeni Lensovet)

SUBMITTED: October 15, 1957

Card 3/3

AUTHORS: Ayzikovich, M. A., Petrov, A. A. SOV/79-28-11-33/55

TITLE: Catalytic Hydration of Vinyl Ethylene Oxide (Katalitiches-
koye gidrirovaniye viniletilenoksidov) II. Hydration
of Chloroprene Oxide (II. Gidrirovaniye okisi khloro-
prena)

PERIODICAL: Zhurnal obshchey khimii, 1950, Vol 28, Nr 11,
pp 3051 - 3055 (USSR)

ABSTRACT: In the present paper (Ref 1) it was shown that in the
catalytic hydration of divinyl oxide mainly the crotyl
alcohol (Position 1,4) is formed as the first product
of hydration. It was of interest to compare these
results to those of the hydration of oxides with
electronegative substituents at the double bond, the
same conditions prevailing. The experimental results
of the hydration of chloroprene oxide (1,2-epoxy-3-
chlorobutene-3) on palladium and nickel are described.
The velocity and the reaction process of the affiliation
of the catalytically influenced hydrogen to chloroprene
oxide were investigated. It was shown that the hydration

Card 1/3

Catalytic Hydration of Vinyl Ethylene Oxide. II.
Hydration of Chloroprene Oxide

SOV/79-28-11-33/55

of chloroprene oxide takes place much more slowly than that of divinyl oxide. The oxide ring affiliates the hydrogen more rapidly than the double bond. In the partial hydration of chloroprene oxide a mixture of two chlorobutenyl alcohols was obtained, and in the complete hydration the normal butyl alcohol. Aldehydes were not formed. The oxide ring opens on the side of the secondary carbon atom, with the affiliation of hydrogen taking place mainly in the position 1.4, due to the linkage of the oxide and double bond. It was shown that the catalytic hydration on Pd/CaCO_3 can serve as a method of quantitatively determining the halogen and the halogen substituted oxides. The figures and tables illustrate the experimental results obtained. There are 2 figures, 2 tables, and 4 Soviet references.

Card 2/3

S/081/62/000/024/039/073
B101/B186

AUTHORS: Ayzikovich, M. A., Borisova, L. A., Zubkov, B. I., Kraus, M.

TITLE: Ethyl alcohol addition to the oxide of asymmetric methyl-phenyl ethylene

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 24, 1962, 316, abstract 24Zh161 (Tr. Leningr. tekhnol. in-ta, im. Lensovet, no. 59, 1961, 22-32)

TEXT: This is a study on the addition of C_2H_5OH to the asymmetric methyl-phenyl ethylene oxide (I) in its dependence on the catalyst used in the presence of C_2H_5ONa and the $(C_2H_5)_2O \cdot BF_3$ complex. Dehydration of dimethyl-phenyl carbinol yielded $C_6H_5C(CH_3)=CH_2$ (II), b.p. $164-166^\circ C/760$ mm Hg. A solution of monochloro urea converts II into $C_6H_5C(CH_3)(OH)CH_2Cl$ (III), b.p. $99-102^\circ C/9$ mm Hg. Stirring of III with 20% NaOH at room temperature yields I, b.p. $84-86^\circ C/16$ mm Hg. Heating of 8 g I and 60 ml C_2H_5OH containing 1 g metallic Na in a sealed tube ($100^\circ C$, 24 hrs), distillation Card 1/3

Ethyl alcohol addition to the ...

S/C81/62/000/024/039/073
B101/B186

of the alcohol, extraction with ether, and fractionation in vacuo yields 44.2% (with respect to I) $C_6H_5C(CH_3)(OH)CH_2OC_2H_5$ (IV), b.p. 114-115°C/10 mm Hg, n_D^{20} 1.5062, d_4^{20} 1.0172. The structure of IV was confirmed by the following synthesis: a three-fold excess of CH_3MgI was caused to act on $C_2H_5OCH_2COC_6H_5$ (V), b.p. 94-96°C/2-3 mm Hg, n_D^{20} 1.5302, 61% of which had been obtained by reaction of C_6H_5MgBr with $C_2H_5OCH_2CN$, b.p. 133-134°C. The latter was obtained with a 46.8% yield from P_2O_5 , reacting with $C_2H_5OCH_2CONH_2$, m.p. 81-83°C, 72% of which had been synthesized from a 28% solution of NH_4OH and $C_2H_5OCH_2COOC_2H_5$. The latter was obtained from the corresponding acid synthesized from C_2H_5ONa and $ClCH_2COOH$. Reaction of C_2H_5ONa with 5.3 g I in 100 ml absolute C_2H_5OH in the presence of 0.5-1 ml $(C_2H_5)_2O \cdot BF_3$ yielded 36% (calculated with respect to I) $C_6H_5C(CH_3)(OC_2H_5)CH_2OH$ (VI), b.p. 120-121°C mm Hg, n_D^{20} 1.5157, Card 2/3

AYZIKOVICH, M.S.

GRANNIKOV, Ya.Ya.; AYZIKOVICH, M.S.

Induction heating of complicated products made of heat-resistant
steel. [Iss.] LONITOMASH no.33:173-186 '54. (MLRA 8:2)
(Induction heating)

AYZIKOVICH, M.S.

Induction heating of blanks of heat-treated alloy
E1437 for drop forging. I. I. Bezruko, Ya. M. Dityar-
kovskii, and M. S. Ayzikovich. *Metallurg*, i Otrabotka
Metal. 1954, No. 4, 58-60. Blanks 32 mm. in diam. and
187 mm. long were heated in an inductor (3 mm. in diam.
and 1000 mm. long) at 99 turns of Cu tubing. (The
2500-cycle generator had a capacity of 100 kw. The blanks
were to be heated to $1100^{\circ} \pm 10^{\circ}$ with variations of not
more than $\pm 10^{\circ}$. Insulating tubes of mica, asbestos,
and fireclay, 2, 3, and 8 mm. in diam., resp., were placed
inside the inductor and outside of the blank being heated.
The inductor was unshielded at the center to permit the two
halves to be connected in parallel and thus keep cos ϕ near 1.
The surface temps. were read by using three suitably spaced
Pt-PtRh thermocouples and a 4th couple was at the center,
15 mm. in from one end. At a specific power of 0.031
kw./sq. cm. and with the blank advancing $1/4$ of the distance
through the inductor every 33 sec., the blank reached 1100°
to within about 10 or 12° at the end of the inductor. The
temp. at the center lagged about 35° behind the surface
during most of the heating period, but within 3 sec. after
removal of the blank from the inductor the center temp.
was nearly the same as that of the surface. The peak
energy for heating was 0.30 kw.-hr. The grain size of
the blanks was 5 to 6 compared to the 3 to 4 grain size
produced by conventional heating. A. G. Gray

Translation from: Referativnyy zhurnal. Metallurgiya, 1959, Nr 1, p 219 (USSR) SOV/137-59-1-1651

AUTHORS: Bezruchko, I. I., Dityatkovskiy, Ya. M., Ayzikovich, M. S.

TITLE: Advanced Stamping Technology Employs Induction Heating
(Peredovaya tekhnologiya shtampovki s primeneniym induktsionnogo nagreva)

PERIODICAL: V sb.: Novoye v kuznechno-shtampovochn. tsekhakh Leningrada.
Leningrad, 1958, pp 78-88

ABSTRACT: The employment of the method of induction heating of blanks in the forging shop made it possible to change over to a more rational technology involving simultaneous stamping of two forgings of the locking crown of a drum in a 1000-ton press with an insert die having two finishing impressions. The high economic efficiency of combining operations of stamping in a press with induction heating of blanks is pointed out. A computation of the economic indices of the new technology is presented and the layout of the working area is described; two induction-heating devices employed in the heating of blanks and hardening of the forging of the locking crown of a drum are also described.

Card 1/1

Ye. L.

BEZRUCHKO, I.I.; AYZIKOVICH, M.S.

Determining the time for the induction heating of titanium alloy ingots for working by pressure. Kuz.-shtam. proizvod. 5 no.12:27-31 D
'63. (MIRA 17:1)

ACCESSION NR: AP4044285

S/0182/64/000/008/0037/0038

AUTHOR: Bozruchko, I.I., Ayzikovich, M.S.

TITLE: Energy consumption during the induction heating of titanium alloys for hot pressing

SOURCE: Kuznechno-shtampovochnoye proizvodstvo, no. 8, 1964, 37-38

TOPIC TAGS: pressing, titanium alloy, titanium alloy pressing, hot pressing, induction heating, energy consumption/alloy IMP2

ABSTRACT: Induction heating of such metals as titanium and its alloys, which are susceptible to absorption of gases at high temperatures, provides an opportunity for raising the productivity and quality of pressing operations. On the basis of experiments conducted with titanium alloy IMP2, the authors tried to determine the appropriate current frequency and to derive equations for induction coil efficiency, specific electrical energy consumption and specific power as functions of the blank diameter and temperature difference across the blank. In these experiments, blanks 25-70 mm in diameter were induction heated at a frequency of 2500 cycles/sec. The internal diameter of the induction coil was 65-100 mm, and heating was continued to 980C. Temperature changes and

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ACCESSION NR: AP4044285

consumption during induction heating is less for titanium than for carbon steel, and that the average efficiency of the whole system is 0.45-0.47 for the heating of titanium alloys. Orig. art. has 3 figures, 2 tables, and 4 formulas.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 01

SUB CODE: MM

NO REF SOV: 000

OTHER: 000

Card^{3/4}

AYZIROVICH, R.S.

BERENITSKAYA, S.A.;KLINOVA, M.S.;GRIGORIYEVA, A.A.;AYZIROVICH, R.S.;BUTOVSKIY,
V.A.;SLOVACHEK, M.A.;ANDRUSHCHUE, A.A.;STARTSEV, I.A.;PROTSKO, G.N.

Effect of schedule and feeding on development of infants from one to
three years of age. *Pediatrics*, Moskva no.6:18-25 Nov-Dec 1953.
(GLML 25:5)

1. Deceased for Butovskiy. 2. Of the Ukrainian Scientific-Research
Institute for the Care of Mother and Child imeni Hero of the Soviet
Union Prof. P. M. Buyko (Director -- M. D. Burova, Honored Physician
Ukrainian SSR) and the Ukrainian Scientific-Research Institute of
Nutrition (Director -- Candidate Medical Sciences A. T. Stovdun).

AYZIKOVICH, R.S.

BEREZNIITSKAYA, S.A.; KLIMOVA, M.S.; GRIGOR'YEVA, A.A.; AYZIKOVICH, R.S.;
BUTOVSKIY, V.A.; SLOVACHEK, M.A.; STARTSEV, I.A.; PROTSKO, G.H.

Effect of regimen and nutrition on the development of 3 to 7-
year old children. *Pediatrics* no.3:91 My-Je '54. (MLRA 8:1)

1. Iz ukrainskogo instituta okhrany materinstva i detstva i
Instituta pitaniya.
(CHILDREN--CARE AND HYGIENE)
(CHILDREN--NUTRITION)

AYZIKOVICH, R. S.

USSR/Medicine

FD-2787

Card 1/1 Pub 154-8/19

Author : Klimov, M. S.; Berezniiskaya, S. A.; Ayzikovich, R. S.;
and Andrushchuk, A. A.

Title : The effect of regimen and nutrition on the state of the
higher nervous activity of children of nursery age

Periodical : Zhur. vys. nerv. deyat. 5, 219-226, Mar-Apr 1955

Abstract : (From a report presented at the 6th Summing-Up Conference
of the Institute OKhMD, 12 Jan 1953). Investigated the
effect of variations in the nursery regimen and nutrition
on the state of the higher nervous activity of children
ranging in age from 1 to 3 years, as evidenced by changes
in the conditional nutritional motor reflexes. Tables.
Nine references, all USSR (4 since 1940).

Institution : Kiev Scientific-Research Institute for the Protection of
Maternity and Childhood imeni P. M. Buyko

Submitted : June 20, 1953

AYZIKOVICH, YA. I.

PA 197T77

USSR/Metals - Cast Iron, Casting

Aug 51

"Treatment of Molten Cast Iron With Magnesium in
Ladles of Large Volume," Ya. I. Ayzikovich, P. G.
I'vovskiy, G. A. Pizarenko, Engineers, Ural Inst
of Ferrous Metals, Nizhny-Tagil Metallurgical
Plant

"Litey Proiz" No 8, pp 23, 24

Describes device for quick immersion of magnesium
into cast iron and for expelling flame and gases
to outside of foundry. Ladle is covered with lid
and magnesium, placed in metal case, is dipped
down to the bottom of ladle with the aid of heavy

197T77

USSR/Metals - Cast Iron, Casting (Contd)

Aug 51

Wt through a hole in lid. Gases are removed
through another hole in lid to which a pipe is
attached.

197T77

AYZIKOVICH, Ya. I.

Permanent molds of magnesium alloy
 Plavko, S. G., Gulyaev, O. A., Kurnetsov, Ya. I.,
 Kuznetsov, P. D., and P. D. Kuznetsov. *Metallurg* 1959, No. 12,
 10-19. -- Cast iron of the following compn.: C 3.3-3.6,
 Si 2.2-2.8, Mn 0.3-0.7, P 0.10-0.18, and S not more than
 0.03% was alloyed in the ladle with sufficient Mg-Si alloy
 coats. 10-20% Mg to give 0.10-0.15% Mg in the metal.
 If metallic Mg is to be used, a 0.3-0.5% addn. must be
 made and the resultant iron modified with 0.3-0.5% of
 75% ferrosilicon. After heat-treatment for spheroidal
 graphite, the molds lasted 2 1/2 times as long as those of
 ordinary iron.
 Y. N. Dedukhinski

High-Temp. Metal Melting Plant

AYZIKOV, CH, U.S.S.R.

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Welds from cast iron with globular graphite for small and medium ingots. G. A. Pivovarov, S. G. G. Abramov, and P. D. Blokhov. *Trudy Inst. za. S. M. Kirova* 1989, No. 60, 97-101. The properties of cast-iron molds and the effects of additions of different elements on these properties. A study of the properties of cast iron decreases its mech. properties. In the cast iron decreases its mech. properties. Plastic properties of the cast iron are improved with a decrease in the Mn and P contents, but the P content should not fall below 0.1% since otherwise the fluidity of the cast iron deteriorates. In the cast iron, cast iron with 0.7-0.8% Mn and 0.12-0.14% P from a Magnitogorsk plant was used. Cast iron for the casting of the molds was melted in cupola furnaces. Its temp. on discharge from the furnaces was 1300-1400°. Sand forms were prepared for casting the molds.

As a result of great vol. contraction of the cast iron treated with Mn, blisters formed in the corners of the upper part of the molds. In order to give the cast iron highly plastic properties, the molds were subjected to graphitizing annealing by heating to 910 ± 10° at a rate no greater than 150°/hr, leaving them at this temp. for 8-10 hrs, cooling to 850° at a rate no greater than 20°/hr, and cooling further with furnace to 100-120° at a rate no greater than 100°/hr. After annealing, the molds were cleaned and trimmed. Before annealing, the chief metallic bulk of the cast iron of the mold was perlitic-ferritic, but after annealing it was ferrite-perlitic. After annealing the quantity of ferrite increased as a result of graphitization of cast iron. Molds of cast iron with globular graphite were prepared. The durability of these molds was 2.0-2.5 times greater than that of the ordinary molds.

Gladya S. Mary

AUTHORS: SOV/133-58-7-27/27
Pisarenko, G.A. Candidate of Technical Sciences and
Guterman, S.G., Candidate of Technical Sciences,
Ayzikovich Ya.I. and Yelokhov, P.D., Engineers

TITLE: Casting Ingot Moulds from Magnesium-inoculated Cast Iron
into Metallic Moulds (Otlivka izlozhnits iz magniyevogo
chuguna v metallicheskiye formy)

PERIODICAL: Stal', 1958, Nr 7, pp 658 - 672 (USSR)

ABSTRACT: An experimental casting of ingot moulds from magnesium-
inoculated cast iron into metal moulds is described. In
the preliminary experiments, the influence of metallic
moulds on the structure of iron before and after carbur-
ising heat treatment was investigated. It was found that
specimens cast in metal moulds and subsequently heat-
treated had a better structure and higher mechanical
properties than those cast into sand moulds (Table 1).
The improvement in mechanical properties is explained by
a finer primary structure, in particular, that of the
phosphide eutectic, accompanied by a decrease in the
structural non-uniformity of the cast iron. Ingot moulds
weighing 630 and 690 kg were cast from magnesium-inoculated
iron in the Lys'va and Nizhniy Tagil plants. The

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AYZIKOVICH, YA. I.

18(5)

PHASE I BOOK EXPLOITATION

SOV/2048

Sverdlovsk. Ural'skiy politkhimicheskiy institut imeni S.M. Kirova
Teoriya i praktika litnogo proizvodstva (Theory and Practice in the
Foundry Industry) Moscow, Mashin, 1959. 231 p. and 32 p. 5,000
(Series: Its: [Sbornik] v. 89) Errata slip inserted.

Ed.: A.A. Gorshkov, Corresponding Member, USSR Academy of Sciences,
Doctor of Technical Sciences, Professor, Tech. Ed.: M.A. Dugin;
Engineer. Ed.: (Ural-Siberian Division, Mashin); A.V. Kalashina.

PURPOSE: This book is intended for engineering and scientific workers
of institutes and machine-building plants, as well as for students
of advanced courses at vuzs.

COVERAGE: This collection consists of articles dealing with practical
problems in foundry processes. The articles review the achieve-
ments of Ural foundry workers in the past 10 years and present
aspects of a current study on the casting of nodular cast iron,
its properties and casting methods. A description is given of
artistic and architectural casting. Consideration is given to the
problem of combating stress in steel and aluminum. The structure
of cast steel is discussed. A recent investigation of vacuum
casting including its characteristic properties and new applications
is also presented. There are 12 pages of photographs illustrating
at the end of the book. No personalities are mentioned. Reference
follow each article.

TABLE OF CONTENTS

Theory and Practice in the Foundry Industry

Khramov, G.A. and A. A. G. (Candidate of Technical Sciences),
Ya. I. Ayzikovich, and P. D. Kichikov (Engineer). Effect of Certain
Factors on the Mechanical Properties and the Structure of Magnesium
Cast Iron for Molds.

The authors discuss the effect of manganese with higher phos-
phorus content and the effect of phosphorus at a higher manga-
nese content on the effect of modification with ferrosilicon. The
distribution of phosphorus in relation to the moldings from the
section determined by the method of radioactive isotopes, and molds
with higher phosphorus content in magnesium cast iron.

Chernobayev, V.P. (Candidate of Mechanical Sciences). Radial
Shrinkage of Cast Iron Rolls

The author presents a method for investigating radial shrinkage
of cast iron rolls and gives the results obtained.

SOV/2048

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PISARENKO, G.A., kand.tekhn.nauk; GUTMAN, S.G., kand.tekhn.nauk;
AYZIKOVICH, Ya.I., inzh.; YKLOKHOV, P.D., inzh.

Effect of certain factors on the mechanical properties and
the structure of magnesium cast iron for molding. Trudy Ural.
politekh.inst. no.89:107-117 '59. (MIRA 12:8)
(Cast iron--Analysis) (Magnesium) (Phosphorus)

S/137/61/000/010/035/056
A006/A101

AUTHORS: Astrov, Ye.I., Gazez'yan, L.N., Ayzikovich, Ya.Z.

TITLE: Multilayer combinations of heat-resistant steels and alloys

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 10, 1961, 15, abstract
10I113 (V sb. "Metallovedeniye i term. obrabotka", Gor'kiy, 1959,
47 - 58)

TEXT: The authors studied the properties of strip and sheet multilayer steels, produced from 3 or 7 layers of stainless and heat-resistant steels of the following grades: X17H2 (Kh17N2), 1X18H9T (1Kh18N9T), X23H18 (Kh23N18), 9H437B (EI437B) and Cr.10 (St.10) steel in various combinations. The sheets of multilayer steels were 1.0 - 1.5 mm thick. It was established that σ_w of multilayer steels was much higher than σ_w of homogeneous metals. Grade TMS-300 (OMZ-300) multilayer steel consisting of 2 layers of Kh23N18 steel with an intermediate EI437B steel layer shows high mechanical properties during brief and long lasting tests at 20, 800 and 900°C. After quenching from 1,200°C

Card 1/2

AYZIKS; BRODSKIY; VIRABOV; VOSKRESENSKIY; GIDZHEU; DONCHAK; ZNAMENSKIY;
KOSTINA; KARITSKAYA; KURNOSOV; PONOMAREV; YAROVITSKIY

Aleksei Aleksandrovich Kriukov. Vest.. otorinolar. 12 no.2:79-80
Mr-Apr '50 (CLML 19:2)

1. Obituary.

FILIMONOV, G.P., kand.fiziko-matemat.nauk [translator]; TRENEVA, S.N.,
kand.tekhn.nauk [translator]; MYZIKS, Yu.D., inzh. [translator];
OVCHAROV, V.T., red.; AKALUNIN, S.A., red.; VORONIN, K.P.,
tekhn.red.

[Traveling-wave tube; translated articles] Lampa s begushchei
volnoi; sbornik perevodnykh statei. Moskva, (os.energ.izd-vo,
1959. 150 p. (MIRA 13:1)
(Traveling-wave tubes)

L 21802-66 EWT(m)/T

ACC NR: AP6012191

SOURCE CODE: UR/0386/66/003/008/0336/0340

AUTHOR: Azimov, M. A.; Basova, Ye. N.; Gulyanov, U. G.; Igamberdiyev, K. R.;
Kolesnik, V. G.; Pantuyev, V. S.; Sil'vestrov, L. V.; Khachatryan, M. N. 46
38
B

ORG: Joint Institute of Nuclear Research (Ob'yedinennyy institut yadernykh issledovaniy); Institute of Nuclear Physics, AN UzSSR, Tashkent (Institut yadernoy fiziki AN UzSSR)

TITLE: Differential cross section of charge exchange of 4.8-GeV/c π^- mesons with protons 19.24445

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 3, no. 8, 1966, 336-340

TOPIC TAGS: pion, charge exchange, differential cross section, spark chamber, Gamma radiation, meson, proton

ABSTRACT: The authors present preliminary results of the measurement of the differential cross section of the reaction $\pi^- + p \rightarrow n + \pi^0$ by a method described earlier (Preprint OIYaI, R-2436, Dubna, 1965), of detecting high-energy π^0 mesons with the aid of a spark chamber and a total-absorption Cerenkov counter. Unlike other methods, this method makes it possible to measure with good accuracy both the angle and the energy characteristics of γ quanta from π^0 meson decays. The

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ACC NR: AP6012191

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setup was irradiated in a beam of 4.8-Gev/c π^- mesons from the OIYAI proton synchrotron. The measurements were made by a difference method using polyethylene and carbon targets. From the energy and angular distributions of the cases when two γ quanta were registered in the chamber the authors calculated the differential and total cross section of the reaction, with corrections evaluated for the following effects: (a) probability of conversion of two γ quanta in the lead converter, (b) probability of conversion of at least one of the γ quanta in the target or in the scintillation-counter material, (c) muon contamination of the beam, and (d) attenuation of the beam in the target. The averaged forward charge-exchange cross section was found to be 0.49 ± 0.1 mb/(Gev/c) 2 , or 0.33 ± 0.07 mb/sr in units of solid angle (c.m.s.) (compared with 0.28 mb/sr from calculation based on the dispersion relations and the known data on the total cross sections of the π^+p and π^-p interactions. The total cross section of the reaction, calculated with account of the experimental geometry and published data on the differential charge-exchange cross section at large 4-momentum transfer is equal to 0.11 ± 0.02 mb. The authors thank V. G. Grishin and M. I. Podgoretskiy for useful discussions, S. V. Mukhin, S. V. Rikhsitskiy, and I. N. Semenyushkin for the opportunity to use the pion channel, and I. V. Chuvilo, M. D. Shaitanov, and I. M. Gramenitskiy for collaboration. Orig. art. has: 2 figures and 2 formulas.

SUB CODE: 20/

SUBM DATE: 8Mar66/

ORIG REF: 002/

OTH REF: 004

Card 2/2

RB

AYZIN, B.A.; POLETAYEV, A.A., redaktor; GUNYGA, A.V., redaktor; NEV-
RAYEVA, N.A., tekhnicheskiiy redaktor.

[Upswing of the workers' movement in Germany at the beginning of
the 20th century, 1903-1906] Pod'em rabocheho dvizheniia v Ger-
manii v nachale XX veka (1903-1906gg). Moskva, Izd-vo Akademii
nauk SSSR, 1954. 160 p. (MLRA 8:2)
(Germany--Labor and laboring classes)

AYZIN, B.A.

[Growth of the labor movement in Germany at the beginning of the
20th century (1903-1906)] Pod"em rabocheho dvizhenia v Germanii v
nachale XX veka (1903-1906 gg.) Moskva, Akad. nauk SSSR, 1954.
393 p.

(Germany--Trade unions)

(MLRA 8:2)

YERUSALIMSKIY, A.S., doktor ist. nauk, otv. red.; ~~AYZIL, B.A.,~~
kand. ist. nauk, red.; GALKIN, I.S., doktor ist. nauk, red.;
GOROSHKOVA, G.N., kand. ist. nauk, red.; SMIRIN, M.M., doktor
ist. nauk, red.; TARTAKOVSKIY, B.G., red. izd-va; NOVICHKOVA,
N.D., tekhn. red.

[German labor movement in the modern period] Germanskoe rabo-
chee dvizhenie v novoe vremia; sbornik statei i materialov.
Moskva, Izd-vo Akad. nauk SSSR, 1962. 405 p. (MIRA 15:10)

1. Akademiya nauk SSSR. Institut istorii.
(Germany--Labor and laboring classes)